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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,327	02/06/2004	Takaaki Sorin	SAN 20.947	8528

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EXAMINER	
JUNG, UNSU	

ART UNIT	PAPER NUMBER
1641	

DATE MAILED: 12/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/774,327	SORIN ET AL.	
	Examiner	Art Unit	
	Unsu Jung	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38 and 74-110* is/are pending in the application.

4a) Of the above claim(s) *16-38 and 82-110* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15,38 and 74-81* is/are rejected.

7)☐ Claim(s) *4,5,12,80 and 81* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/6/04 &7/29/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicants' preliminary amendments to the specification in the reply filed on February 6, 2004 have been acknowledged and entered.

2. Applicants' preliminary amendments canceling of claims 39-73, amendment of claims 4, 6, 8, 10-24, 26-35, and 37, and addition of claims 74-110 have been acknowledged and entered.

3. Claims 1-38 and 74-110 are pending.

Election/Restrictions

4. Applicant's election with traverse of Group I (claims 1-15, 38, and 74-81) in the reply filed on October 20, 2005 is acknowledged. The traversal is on the ground(s) that a difference between the angles that each adjacent two diffraction grating surfaces form with a predetermined reference plane is brought to an infinitestimal value, the SPR sensor chip according to claim I may include the one according to Group XV. Applicants therefore conclude that the inventions as claimed are not independent because there is a disclosed relationship between the inventions, that is, they are connected in design, operation, and effect. Applicants further argue that there would not be a serious burden on the examiner if restriction is not required. This is not found persuasive because the feature of "a difference between the angles that each adjacent two diffraction grating

surfaces form with a predetermined reference plane is brought to an infinitestimal value" is not recited in the claim(s) of Groups I and XV. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). As discussed in the Office Action filed on September 20, 2005, In the instant case the product of Group I includes a groove pitch and a groove orientation of each diffraction grating surface, in addition to an angle that each diffraction grating surface forms with a predetermined reference plane, are adjusted in such a manner that when the diffraction grating surfaces are projected onto a predetermined projection plane, the groove orientations in the projection plane are identical while the groove pitches in the projection plane are different among the diffraction grating surfaces, which are not required by the product of Group XV. The product of Group XV includes a diffraction grating curved surface having a curved surface form in a convex shape whose-light irradiated side bulges out, which is not required by the product of Group I. Therefore, the products of Groups I and XV have different modes of operation. Because these inventions are distinct for the reasons given above, have acquired a separate status in the art because of their recognized divergent subject matter, and searches for one group are not required by the others, restriction for examination purposes as indicated is proper.

The requirement is still deemed proper and is therefore made FINAL.

Drawings

5. The drawings are objected to because Fig.'s 4(a), 4(b), 4(c), 18(a), 18(b), and 18(c) must be separately listed and described in the "Brief Description of the Drawings" section of the specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

angles "α_e" and "α_h" for Fig. 2;

reference numbers "P11", "P12", "P21", "P22", "P31", "P32", "P41", and "P42" for Fig. 17 (p136, line 22);

reference number "B0" (p176, line 14), "S2" (p176, line 19) and "Px" (p177, lines 3 and 7) for Fig. 32;

reference characters "θ2" (p179, lines 5, 13, and 18), "θ3" (p179, lines 15 and 18), and "θ4" (p179, lines 16 and 18) for Fig. 33;

reference characters "P11" and "P12" (p5, line 26) for Fig. 51; and

reference character "θb" (p10, line 14) for Fig. 52(b).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

7. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

reference numbers "P1", "P2", "P3", and "P4" in Fig. 17;

reference number "23" (a metal layer, p141, line 14) in the current specification should be "203" as indicated in Fig. 19;

reference numbers "ω1" and "ω2" in Fig. 32;

reference character "θ" in Fig. 33;

reference character "D" in Fig. 39;

reference character "P1" in Fig. 51; and

reference character "θ" in Fig. 52(b).

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

8. The claims are objected to because the lines are crowded too closely together, making reading difficult. Substitute claims with lines one and one-half or double spaced on good quality paper are required. See 37 CFR 1.52(b).

9. The use of the trademark FLEX CHIP™ (p191, line 17; p194, line 1; p195, line 7; p203, line 17; p205, line 20; p209, line 10) has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Claim Objections

10. Claim 4 is objected to because of the following informalities: a comma is needed following the word "shape" in line 4. Appropriate correction is required.

11. Claim 5 is objected to because of the following informalities: a comma is needed following the word "shape" in line 5. Appropriate correction is required.

12. Claims 12, 80, and 81 are objected to because of the following informalities: a comma is needed following the word "direction" in line 10. Appropriate correction is required.

Claim Rejections - 35 USC § 112

13. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

14. Claims 1-15, 38, and 74-81 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

15. In claim 1, the phrase "on each of which a diffraction grating with a uniform groove orientation and a uniform groove pitch is formed so as to generate an evanescent wave upon light irradiation" in lines 7-9 is vague and indefinite. It is unclear whether the phrase "on each of which a diffraction grating with a uniform groove orientation and a uniform groove pitch is formed so as to generate an evanescent wave upon light irradiation" is referring to "a plurality of diffraction grating surfaces" or "metal layer."

16. Regarding claims 1, 2, 4, and 38, the phrase "so as to" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

17. Regarding claims 1, 2, 3, and 38, the phrase "in such a manner" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

18. In claim 2, the phrase "as to form a predetermined inclination angle (αa-αl) with the reference plane (S0)" in lines 6-7 is vague and indefinite. It is not clear whether or

not the phrase "as to form a predetermined inclination angle (αa-αI) with the reference plane (S0)" is referring to "diffraction grating surface" in line 3.

19. Claim 5 recites the limitation "the aggregate" in line 4. There is insufficient antecedent basis for this limitation in the claim.

20. The term "concentratedly" in claim 8 is a relative term which renders the claim indefinite. The term "concentratedly" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The limitation "disposed diffraction grating surfaces" has been rendered indefinite by the use of the term "concentratedly."

21. In claim 13, the word "associated" in lines 3 and 12 is vague and indefinite. The specification does not define the word and it is unclear as to what the word "associated" means.

22. The term "concentratedly" in claim 13 is a relative term which renders the claim indefinite. The term "concentratedly" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The limitation

"disposed non-diffraction surfaces" has been rendered indefinite by the use of the term "concentratedly."

23. The term "minimum" in claim 74 is a relative term which renders the claim indefinite. The term "minimum" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The term "width" has been rendered indefinite by the use of the term "minimum."

Claim Rejections - 35 USC § 102

24. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

25. Claims 1, 2, 6, 7, 38, and 74-77 are rejected under 35 U.S.C. 102(b) as being anticipated by Challener et al. (U.S. Patent No. 5,994,150, Nov. 30, 1999).

Challener et al. anticipates instant claims by teaching a surface plasmon resonance chip comprising a metal layer along whose surface a surface plasmon wave can be induced by light irradiation (column 3, lines 11-13) and a plurality of diffraction grating surfaces that are disposed in the vicinity of the metal layer and on each of which a diffraction grating with a uniform groove orientation and a uniform groove pitch is

formed so as to generate an evanescent wave upon light irradiation (Fig. 8), wherein the groove pitch and groove orientation of each said diffraction grating surface, in addition to the angle that each said diffraction grating surface forms with a predetermined reference plane, are adjusted in such a manner that when the diffraction grating surfaces are projected onto a predetermined projection plane, the groove orientation in the projection plane are identical while the groove pitches in the projection plane are different among the diffraction grating surfaces (Fig. 8).

With respect to claim 2, Challener et al. teaches the surface plasmon resonance sensor chip of claim 1, wherein each said diffraction grating surface is disposed so as to be perpendicular to a specific plane, which is perpendicular to the predetermined reference plane, and as to form a predetermined inclination angle with the reference plane, and on each said diffraction grating surface, the diffraction grating is formed in such a manner that the groove orientation is perpendicular to the specific plane (Fig. 8).

With respect to claim 6, Challener et al. teaches the surface plasmon resonance sensor chip of claim 2, wherein each said diffraction grating surface is formed along a sensor surface, which comes in contact with a sample, and on the sensor surface, a binding substance that binds specifically to a target species in the sample is immobilized for each said diffraction grating surface (column 11, lines 43-45).

With respect to claim 7, Challener et al. teaches the surface plasmon resonance sensor chip of claim 6, wherein two or more kinds of binding substances are immobilized for each said diffraction grating surface (column 11, lines 43-45).

With respect to claim 38, Challener et al. teaches the surface plasmon resonance sensor chip of claim 1, wherein each said diffraction grating surface is disposed so as to be parallel to a predetermined reference plane, and on each said diffraction grating surface, the diffraction grating is formed in such a manner that the groove orientations are identical while the groove pitches are different among diffraction grating surfaces.

With respect to claim 74, Challener et al. teaches the surface plasmon resonance sensor chip of claim 38, wherein at least on of the diffraction grating surfaces has a minimum width with one groove alone (Fig. 8).

With respect to claims 75 and 76, Challener et al. teaches the surface plasmon resonance sensor chip of claims 38 and 74, wherein each said diffraction grating surface is formed along a sensor surface, which comes in contact with a sample, and on the sensor surface, a binding substance that binds specifically to a target species in the sample is immobilized for each said diffraction grating surface (column 11, lines 43-45).

With respect to claim 77, Challener et al. teaches the surface plasmon resonance sensor chip of claim 75, wherein two or more kinds of binding substances are immobilized for each said diffraction grating surface (column 11, lines 43-45).

Claim Rejections - 35 USC § 103

26. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

27. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

28. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

29. Claims 3-5, 8, 9, 11, 14, and 79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Challener et al. (U.S. Patent No. 5,994,150, Nov. 30, 1999) in view of Knoll (U.S. Patent No. 5,442,448, Aug. 15, 1995).

Challener et al. teaches a surface plasmon resonance sensor chip as discussed above. However, Challener et al. fails to teach a surface plasmon resonance sensor

chip, wherein the plural diffraction grating surfaces are positioned in decreasing order to inclination angle that each said diffraction grating surface forms with the reference plane.

Knoll teaches a grating structure designed in a multidiffractive fashion (diffraction grating surfaces are positioned in decreasing order to inclination angle that each said diffraction grating surface forms with the reference plane, Fig. 6) for laterally resolved detection of a change in the layer thickness of the object layer which results from a specific binding reaction of a first binding partner bound to the object layer with an unbound second binding partner (Abstract). These measures allow to observe investigation region of the object layer, as in normal optical microscopy and as a result, the measurement technique is simplified and at the same time the conditions of the optical imaging of the investigation region are improved (column 5, lines 54-59).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in the surface plasmon resonance sensor chip of Challener et al. with diffraction grating surfaces are positioned in decreasing order to inclination angle that each said diffraction grating surface forms with the reference plane as taught by Knoll in order to observe investigation region of the object layer, as in normal optical microscopy and as a result, the measurement technique is simplified and at the same time the conditions of the optical imaging of the investigation region are improved.

With respect to claims 4 and 5, Knoll teaches a surface plasmon resonance sensor chip, wherein each said diffraction grating surface has a minimum width with one

groove alone and the aggregate of the diffraction grating surfaces forms a curved surface in an arc shape whose light-irradiated side bulges out (Fig. 6).

With respect to claim 8, Challener et al. teaches a surface plasmon resonance sensor chip, further comprising a plurality of diffraction areas, within each of which said diffraction grating surfaces are concentratedly disposed (column 11, lines 43-45) and Knoll teaches that the plural diffraction grating surfaces in each of the said diffraction areas have different inclination angles (Fig. 6).

With respect to claim 9, Challener et al. teaches a surface plasmon resonance sensor chip, wherein each said diffraction grating surface is formed along a sensor surface, which comes in contact with a sample, and on the sensor surface, a binding substance that binds specifically to a target species in the sample is immobilized for each said diffraction grating surface (column 11, lines 43-45).

With respect to claim 11, 14, and 79, Knoll teaches a surface plasmon resonance sensor chip, wherein each of one or more diffraction grating surface has a reaction area, within which the binding substance is immobilized, and a non-reaction area, within which a substance that does not bind to any target species in the sample is immobilized, or alternatively, any substance is not immobilized (column 1, lines 6-13).

30. Claims 12 and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Challener et al. (U.S. Patent No. 5,994,150, Nov. 30, 1999) in view of Malmqvist et al. (U.S. Patent No. 6,200,814, Filed Jan. 20, 1998).

Challener et al. teaches a surface plasmon resonance sensor chip as discussed above. However, Challener et al. fails to teach a surface plasmon resonance sensor chip, further comprising a cover for covering the sensor surface and a plurality of flow channels formed side by side between the sensor surface and the cover so as to pass along the direction, in which the diffraction grating surfaces are arranged.

Malmqvist et al. teaches a device for laminar flow on a sensing surface (Abstract) with a cover for covering the sensing surface (Fig. 11B) for use with optical detection methods such as surface plasmon resonance (column 7, lines 41-47). Malmqvist et al. teaches a method of controlling a fluid flow over a sensing surface using laminar flow technique to bring the fluid (also referred to as "sample flow") into contact with one or more discrete areas on the sensing surface, as well as to prepare sensing surfaces (column 7, lines 20-35).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in the surface plasmon resonance sensor chip of Challener et al. with a device for laminar flow on a sensing surface with a cover for covering the sensing surface as taught by Malmqvist et al. in order to bring the fluid (also referred to as "sample flow") into contact with one or more discrete areas on the sensing surface, as well as to prepare sensing surfaces.

31. Claims 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Challener et al. (U.S. Patent No. 5,994,150, Nov. 30, 1999) in view of Knoll (U.S. Patent

No. 5,442,448, Aug. 15, 1995) as applied to claim 8 above, and further in view of Malmqvist et al. (U.S. Patent No. 6,200,814, Filed Jan. 20, 1998).

Challener et al. in view of Knoll teaches a surface plasmon resonance sensor chip as discussed above. However, Challener et al. in view of Knoll fails to teach a surface plasmon resonance sensor chip, further comprising a cover for covering the sensor surface and a plurality of flow channels formed side by side between the sensor surface and the cover so as to pass along the direction, in which the diffraction grating surfaces are arranged.

Malmqvist et al. teaches a device for laminar flow on a sensing surface (Abstract) with a cover for covering the sensing surface (Fig. 11B) for use with optical detection methods such as surface plasmon resonance (column 7, lines 41-47). Malmqvist et al. teaches a method of controlling a fluid flow over a sensing surface using laminar flow technique to bring the fluid (also referred to as "sample flow") into contact with one or more discrete areas on the sensing surface, as well as to prepare sensing surfaces (column 7, lines 20-35).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in the surface plasmon resonance sensor chip of Challener et al. in view of Knoll with a device for laminar flow on a sensing surface with a cover for covering the sensing surface as taught by Malmqvist et al. in order to bring the fluid (also referred to as "sample flow") into contact with one or more discrete areas on the sensing surface, as well as to prepare sensing surfaces.

32. Claim 81 is rejected under 35 U.S.C. 103(a) as being unpatentable over Challener et al. (U.S. Patent No. 5,994,150, Nov. 30, 1999) in view of Knoll (U.S. Patent No. 5,442,448, Aug. 15, 1995) and Malmqvist et al. (U.S. Patent No. 6,200,814, Filed Jan. 20, 1998).

Challener et al. teaches a surface plasmon resonance sensor chip as discussed above. However, Challener et al. fails to teach a surface plasmon resonance sensor chip, further comprising a cover for covering the sensor surface and a plurality of flow channels formed side by side between the sensor surface and the cover so as to pass along the direction, in which the diffraction grating surfaces are arranged. Challener et al. further fails to teach a surface plasmon resonance sensor chip, wherein each diffraction grating surface has a reaction area, within which the binding substance is immobilized and a non-reaction area, within which a substance that does not bind specifically to any target species in the sample is immobilized or, alternatively, any substance is not immobilized.

Malmqvist et al. teaches a device for laminar flow on a sensing surface (Abstract) with a cover for covering the sensing surface (Fig. 11B) for use with optical detection methods such as surface plasmon resonance (column 7, lines 41-47). Malmqvist et al. teaches a method of controlling a fluid flow over a sensing surface using laminar flow technique to bring the fluid (also referred to as "sample flow") into contact with one or more discrete areas on the sensing surface, as well as to prepare sensing surfaces (column 7, lines 20-35). Malmqvist et al. further teaches a plurality of flow channels

formed side by side between the sensor surface and the cover so as to pass along the direction, in which the diffraction grating surfaces are arranged (Fig. 10)

Knoll teaches a method of detecting change in an object layer (sensing surface), wherein the change is difference in thickness of the object layer, which results from a specific binding reaction of a first binding partner bonded to the object layer with an unbound second binding partner (column 1, lines 6-12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in the surface plasmon resonance sensor chip of Challener et al. with a device for laminar flow on a sensing surface with a cover for covering the sensing surface and a plurality of flow channels formed side by side between the sensor surface as taught by Malmqvist et al. in order to bring the fluid (also referred to as "sample flow") into contact with one or more discrete areas on the sensing surface, as well as to prepare sensing surfaces. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in the surface plasmon resonance sensor chip of Challener et al. with a one of the sensing surface is a non-reaction area (object layer with an unbound second binding partner) as taught by Knoll in order to measure difference in thickness of the sensing surface upon an occurrence of a specific binding reaction.

Allowable Subject Matter

33. Claims 10, 13, and 78 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

34. The following is a statement of reasons for the indication of allowable subject matter: Challener et al. teaches a surface plasmon resonance sensor chip as discussed above. However, Challener et al. fails to teach a surface plasmon resonance sensor chip, further comprising a plurality of non-diffraction grating surfaces, which do not have any diffraction grating, wherein each of the non-diffraction grating surfaces is disposed along the sensor surface in the same plane with the respective one of the diffraction grating surfaces.

Conclusion

35. No claim is allowed.

36. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Unsu Jung whose telephone number is 571-272-8506. The examiner can normally be reached on M-F: 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Unsu Jung, Ph.D.
Patent Examiner
Art Unit 1641

LONG V. LE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600
12/09/05